P. HEILIGER.

BELLOWS.

APPLICATION FILED SEPT. 16, 1920.

1,382,081. Patented June 21, 1921.

Fig. 1.

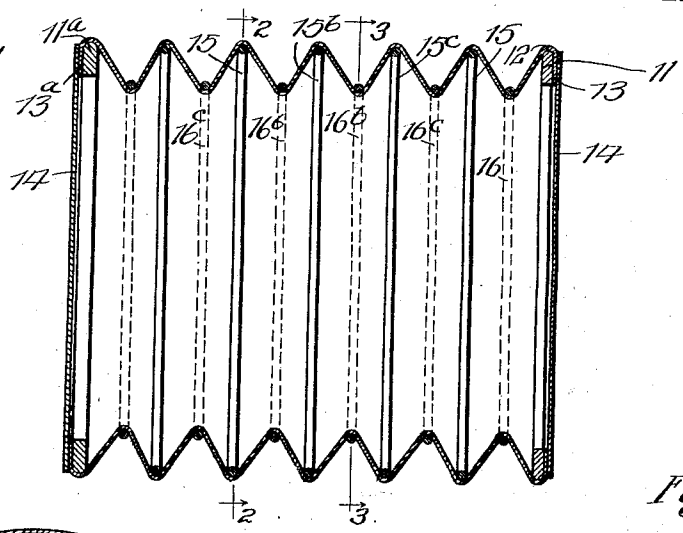


Fig. 2.

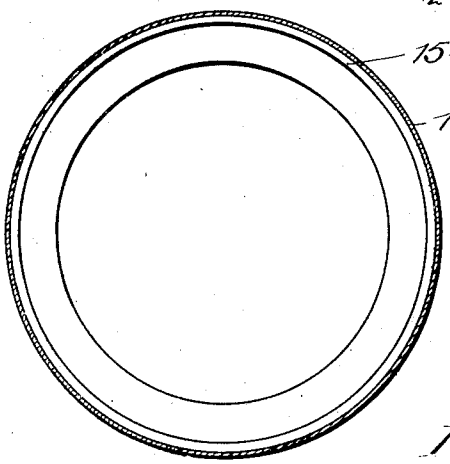


Fig. 3.

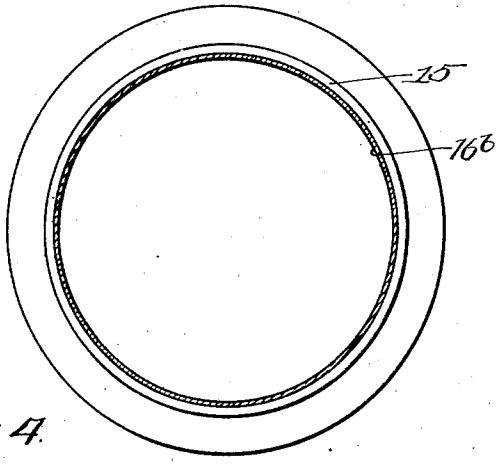
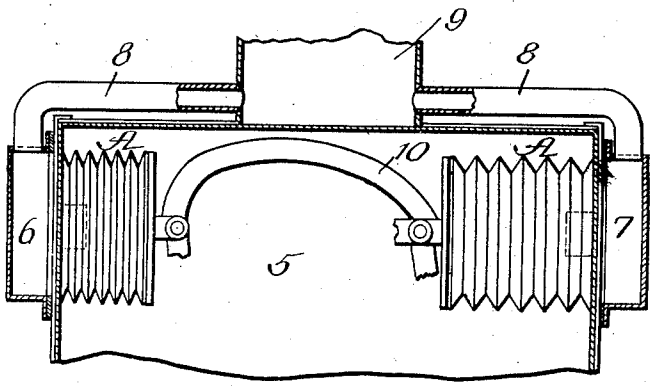


Fig. 4.



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UNITED STATES PATENT OFFICE.

PAUL HEILIGER, OF FOREST PARK, ILLINOIS.

BELLOWS.

1,382,081. Specification of Letters Patent. Patented June 21, 1921.

Application filed September 16, 1920. Serial No. 410,604.

To all whom it may concern:

Be it known that I, PAUL HEILIGER, a citizen of the United States, residing at Forest Park, in the county of Cook and State of Illinois, have invented new and useful Improvements in Bellows, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in bellows especially applicable to vacuum cleaners, and has for its object the production of a bellows that will give efficient service with few parts.

A further object is the production of a device that can be cheaply and quickly assembled, and one not liable to disarrangement of parts.

These and such other objects as may appear hereinafter are attained by my device, an embodiment of which is illustrated in the accompanying drawing, in which—

Figure 1 represents a sectional view of my improved bellows;

Fig. 2 represents a sectional view on the line 2—2 of Fig. 1, looking in the direction indicated by the arrows;

Fig. 3 represents a sectional view on the line 3—3 of Fig. 1, looking in the direction indicated by the arrows; and

Fig. 4 represents a perspective view with parts broken away, showing a portion of a vacuum cleaner with my improved bellows in position.

Like numerals of reference indicate like parts in the several figures of the drawings.

Referring now to the drawings—5 represents a vacuum cleaner with bellows openings 6, 7, from which pipes 8, 8 communicate with the dust or suction chamber 9. The bellows A, A are rigidly mounted at one end within the casing, and pivotally connected together by a curved connecting arm 10.

No further description of the operation of the vacuum cleaner is thought necessary at this time, as this application has to do simply with the construction of the bellows itself, which may be used in connection with other devices than vacuum cleaners, if desired.

Referring now to Figure 1—the bellows proper comprises end rings 11, 11^a, over the ends of which is drawn the fabric 12 forming the covering for the bellows. The end of the fabric is turned down over the ends, as indicated at 13, 13^a, and rings 14, 14^a secured thereto binding the fabric tightly against the end rings. Intermediate spreader rings 15, of a diameter practically the same as that of the end rings, are provided, and placed within the interior of the bellows. Intermediate rings 16 are provided, spaced apart between the other inside rings, this construction giving the concertina effect of the ordinary bellows.

In forming my improved construction, I take a fabric cylinder open at both ends and force within a ring 15^b, pushing the ring inside the fabric until it reaches the center. I then place outside the fabric similar rings 16^b, 16^b, and insert from either side rings 15^c, 15^c; then smaller rings on the outside, 16^c, 16^c, and continue until the entire length of the bellows desired is built up. I then insert the end rings 12, pulling the fabric tightly around the ring, and place the end plate ring 14 in position, securing it tightly against the end rings 11^a, 11^a.

By this method of construction I am able to provide a device that can be very quickly constructed, and once constructed is never liable to disarrangement of parts.

After the interior rings are in place, they can be secured in permanent position by stitching or fastening in any way, care being taken to close any openings so that the bellows may operate efficiently.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States:

1. The method of forming bellows comprising the use of cylindrical fabric, the forcing within said fabric of distending rings, placing restraining rings over said fabric on either side of said distending rings, alternately putting in position distending and restraining rings until the proper length of bellows is formed, placing at the end of said bellows end rings, pulling the fabric

over the outside of said rings and securing it in place by a plate ring.

2. The method of forming bellows comprising the use of cylindrical fabric, the forcing within said fabric of distening rings, placing restraining rings over said fabric on either side of said distending rings, alternately putting in position distending and restraining rings until the proper length of bellows is formed, placing at the end of said bellows end rings, and securing said fabric to said end rings.

In witness whereof, I have hereunto subscribed my name.

PAUL HEILIGER.